What is claimed is:

1. An apparatus for treating gas prior to the use of the gas in a medical procedure involving a patient, the gas being received into the apparatus from an insufflator which receives gas from a gas source, and the gas exiting the apparatus being in flow communication with a means for delivering the gas to the interior of the patient, wherein the gas is pressure-and volumetric flow rate-controlled by the insufflator, the apparatus comprising:

a) a housing defining a chamber having an entry port and an exit port, the exit port adapted to be in flow communication with the means for delivering and the inlet adapted to be in flow communication with the outlet of the insufflator;

c) humidification means disposed within the chamber in the path of travel of the gas through the chamber for humidifying the gas as it travels through the chamber;

d) humidity sensing means disposed within the chamber for sensing the humidity of gas as it exits the chamber; and

e) monitoring means connected to the humidity sensing means for monitoring the humidity of the gas exiting the chamber.

2. The apparatus of claim 1, wherein the humidification means contains a volume of liquid in flow communication with the gas as it passes through the chamber.

3. The apparatus of claim 2, wherein the monitoring means detects when the humidification means requires recharging of liquid and generates a recharge signal indicative thereof.

4. The apparatus of claim 3, and further comprising alarm means responsive to the recharge signal to generate an alarm suitable for alerting a user that the humidification means requires recharging.

5. The apparatus of claim 4, wherein the alarm means is an audible alarm and/or visual alarm.

6. The apparatus of claim 4, and further comprising a charging port on the housing to permit recharging of the humidification means with liquid.

7. The apparatus of claim 6, wherein the charging port comprises a member that permits the introduction of liquid into the chamber.

8. The apparatus of claim 7, wherein the member is a resealable member.

9. The apparatus of claim 3, wherein the monitoring means determines when the relative humidity of gas in the chamber drops below a predetermined relative humidity threshold and generates the recharge signal in response thereto.

10. The apparatus of claim 9, wherein the monitoring means determines when the relative humidity of gas drops below a critical relative humidity threshold which is lower than the predetermined relative humidity threshold and generates a warning signal in response thereto.

11. The apparatus of claim 1, wherein the humidification means comprises at least one layer of liquid-retaining material capable of retaining a volume of liquid.

12. The apparatus of claim 11, wherein the at least one layer of liquid-retaining material is pre-charged with the volume of liquid.

13. The apparatus of claim 11, wherein the at least one layer of liquid-retaining material is rechargeable with liquid.

14. The apparatus of claim 1, wherein the humidification means comprises a plurality of water-retaining layers.

15. The apparatus of claim 1, wherein the humidity sensing means is positioned in the chamber in the flow path of the gas proximate the exit port of the housing.

16. The apparatus of claim 1, wherein the humidity sensing means is a humidity sensitive capacitor.

17. The apparatus of claim 1, wherein the housing is for connection to the means for delivering so as to be immediately adjacent the patient.

18. The apparatus of claim 1, and further comprising:

heating means disposed within the chamber for heating the gas; and

temperature sensing means disposed within the chamber for sensing the temperature of the gas in the chamber; and

control means connected to the temperature sensing means and to the heating means and responsive to the temperature sensing means to control electrical power to the heating means so as to regulate the amount of heat applied by the heating means to the gas within the chamber, thereby maintaining the gas at a predetermined temperature.

19. The apparatus of claim 18, wherein the control means is responsive to the monitoring means determining when the relative humidity of gas drops below a critical relative humidity threshold to terminate electrical power to the heating means.

20. The apparatus of claim 18, wherein the heating means is disposed within the chamber substantially co-located with the humidification means so that the gas is substantially simultaneously heated and hydrated.

21. The apparatus of claim 18, wherein the humidity sensing means and the temperature sensing means are disposed in the chamber downstream from the heating means.

22. The apparatus of claim 18, wherein the heating means comprises an electrical resistive wire.

23. The apparatus of claim 22, wherein the electrical resistive wire is arranged in a concentrically coil configuration within the housing.

24. The apparatus of claim 1, and further comprising filter means connected to the means for communicating upstream from the housing for filtering the gas exiting the insufflator.

25. The apparatus of claim 1, and further comprising an AC/DC converter connected to the monitoring means and suitable for connection to a standard AC power supply, and which generates a DC voltage suitable for powering the monitoring means.

26. The apparatus of claim 1, and further comprising a battery for supplying a DC voltage suitable for powering the monitoring means.

27. The apparatus of claim 1, wherein the monitoring means is contained within an electrical housing and is connected to the humidification means and to the humidity sensing means by an insulated electrical cable.

28. The apparatus of claim 27, and further comprising a removable electrical connector that terminates one end of the insulated electrical cable and connects to a receptacle in the electrical housing.

29. The apparatus of claim 1, wherein the monitoring means comprises:

an oscillator circuit connected to the humidity sensing means, wherein the oscillator circuit generates an output signal with a frequency dependent on a capacitance of the humidity sensing means; and

a microcontroller connected to the oscillator circuit that measures a characteristic of the output signal of the oscillator circuit to determine a measure of the relative humidity of the gas exiting the chamber.

30. The apparatus of claim 29, wherein the output signal generated by the oscillator circuit is a square wave, and wherein the microcontroller measures a width of a phase of the output signal to determine a measure of the relative humidity of the gas exiting the chamber.

31. The apparatus of claim 29, and further comprising:

heating means disposed within the chamber for heating the gas; and

temperature sensing means disposed within the chamber for sensing the temperature of the gas in the chamber; and

an operational amplifier connected to the temperature sensing means to generate as output a signal representing the temperature of the gas exiting the chamber;

an analog-to-digital converter connected to the operational amplifier to convert the signal output by the operational amplifier to a digital word representing the temperature of the gas;

wherein the microcontroller is connected to the analog-to-digital converter and is responsive to the digital word output by the analog-to-digital converter to control electrical power to the heating means so as to regulate the amount of heat applied by the heating means to the gas within the chamber, thereby maintaining the gas at a predetermined temperature.

32. A method of providing, for any selected period of time, heated and humidified gas into a patient for a medical procedure comprising the steps of:

a) directing a gas from a gas source into a chamber;

b) humidifying the gas within the chamber with a volume of liquid;

c) sensing the humidity of the gas as it exits the chamber; and

d) monitoring the humidity of the gas exiting the chamber.

33. The method of claim 32, wherein the step of monitoring comprises determining when the volume of liquid in the chamber requires replenishing based on the humidity of the gas in the chamber.

34. The method of claim 33, wherein the step of monitoring comprises determining when the relative humidity of the gas in the chamber drops below a predetermined relative humidity threshold.

35. The method of claim 33, and further comprising the step of generating an alarm when it is determined that the volume of liquid in the chamber requires replenishing.

36. The method of claim 35, and further comprising the step of recharging the chamber with liquid in response to the alarm.

37. The method of claim 35, wherein the alarm is continued until it is determined that the chamber has been replenished with liquid based on the humidity of the gas in the chamber.

38. The method of claim 32, and further comprising the step of generating an alarm when it is determined that the humidity of the gas in the chamber drops below a critical relative humidity threshold.

39. The method of claim 32, and further comprising steps of:

heating the gas within the chamber with a heating element;

sensing the temperature of the gas as it exits the chamber; and

controlling electrical power to the heating element so as to regulate the temperature of the gas as it exits the chamber.

40. The method of claim 39, and further comprising the step of terminating electrical power to the heating element when it is determined that the humidity of the gas in the chamber drops below a critical relative humidity threshold.

41. The method of claim 39, wherein the step of humidifying and the step of heating are performed on the gas substantially simultaneously within the chamber.

42. The method of claim 39, wherein the step of sensing the humidity and sensing the temperature are performed in the flow path of the gas downstream from the steps of heating and humidifying in the chamber.

43. The method of claim 32, and further comprising the step of positioning the chamber immediately adjacent the patient.

44. The method of claim 32, and further comprising the step of filtering the gas prior to the step of humidifying.

45. An apparatus for conditioning gas for use in a medical procedure involving a patient, the gas being received into the apparatus from a gas source, the apparatus comprising:

a) a housing defining a chamber having an entry port and an exit port, the entry port adapted to be in flow communication with the gas source and the exit port delivering conditioned gas therefrom;

c) humidification means disposed within the chamber in the path of travel of the gas through the chamber for humidifying the gas as it travels through the chamber;

d) humidity sensing means disposed within the chamber for sensing the humidity of gas as it exits the chamber; and

e) monitoring means connected to the humidity sensing means for monitoring the humidity of the gas exiting the chamber.

46. The apparatus of claim 45, wherein the humidification means contains a volume of liquid in flow communication with the gas as it passes through the chamber.

47. The apparatus of claim 45, and further comprising:

a heating element disposed in the chamber;

a temperature sensor disposed in the chamber to sense the temperature of the gas as it exits the chamber; and

a control circuit connected to the temperature sensor and to the heating element, and responsive to the temperature sensor to control electrical power to the heating element

so as to regulate the amount of heat applied by the heating element to the gas within the chamber, thereby maintaining the gas at a predetermined temperature.

48. The apparatus of claim 45, wherein the monitoring means determines that the humidification means requires recharging of liquid when the humidity of the gas in the chamber drops below a predetermined relative humidity threshold.

49. The apparatus of claim 45, and further comprising an alarm connected to the monitoring means and responsive to a recharge signal generated by the monitoring means to generate an alarm suitable for alerting a user that the at least one liquid-retaining layer requires recharging.

50. The apparatus of claim 45, and further comprising a charging port on the housing to permit recharging of the humidification means with liquid.

51. The apparatus of claim 45, wherein the humidification means is pre-charged with a volume of liquid.

52. The apparatus of claim 52, wherein the humidification means is rechargeable with a liquid.